

HD20

Heavy Duty Incremental Encoder

Features

Incremental encoder with 2" outer diameter

Heavy-duty shaft and bearings

Quadrature output with reference marker

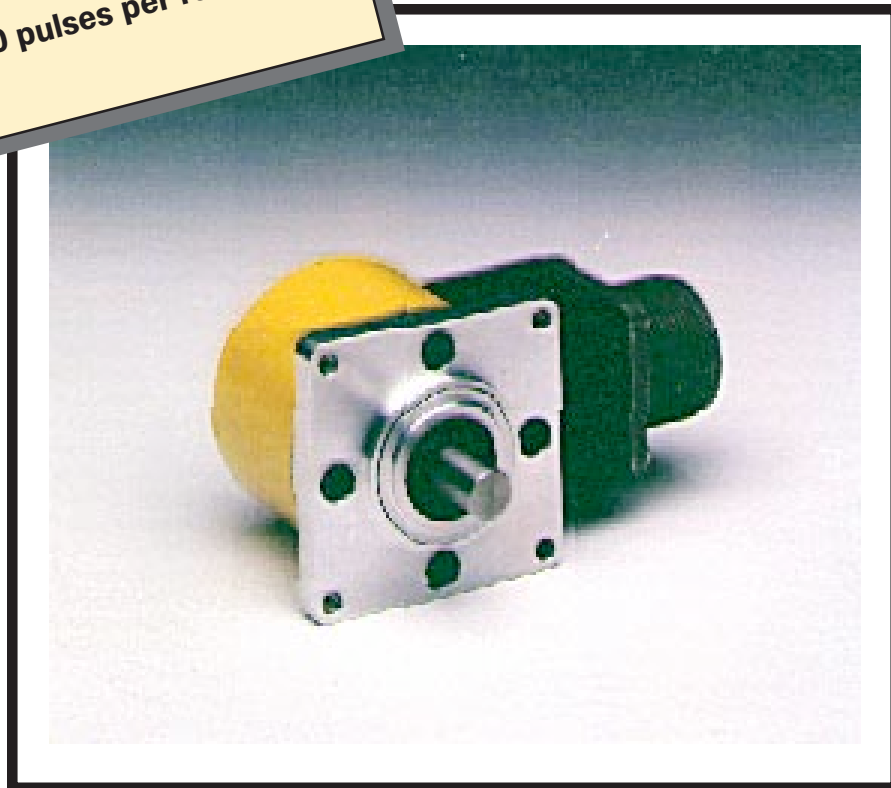
IP65 protection

5 V Line Driver output

5 V or 12 V Open Collector output

8 V to 24 V Line Driver output

10 to 2500 pulses per revolution



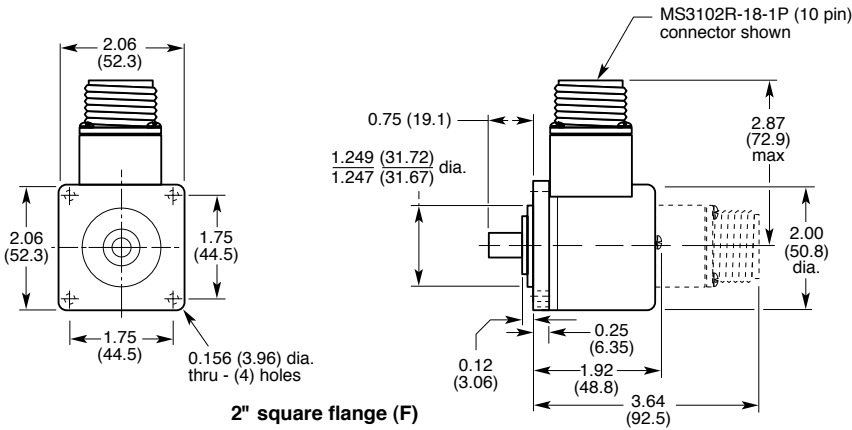
Technical Data/Features

Number of pulses per revolution (Z)	10, 20, 30, 50, 60, 100, 128, 150, 180, 200, 240, 250, 256, 300, 336, 360, 400, 500, 512, 600, 720, 800, 900, 960, 1000, 1024, 1140, 1152, 1200, 1230, 1250, 1260, 1270, 1386, 1500, 1512, 1800, 1888, 2000, 2048, 2400, 2500
Interfaces	RS-422 (3487 Line driver) Open collector (7406) 8-24 V Line driver (7272)
Dimensions	See drawing
Mass	8 oz (0.23 kg)
Moment of inertia of rotor	2.4×10^{-4} oz-in-sec ² (16.9 gcm ²)
Measurement step	90/Z°
Reference (marker) signal	Number: 1 Position: Non-gated 180°±90° electrical Gated 180° nominal (gated w/count channel B)
Error limits	45/Z°
Measurement step deviation	45/Z°
Max output frequency	100 kHz
Max operating speed	3000 rpm at max shaft loading 5000 rpm at reduced shaft loading
Max angular acceleration	50,000 radians/sec ²
Max starting torque	without shaft seal 1.5 oz-in (10.5 Ncm) with shaft seal 5.0 oz-in (35.0 Ncm)
Permissible shaft loading	Radial (at end of shaft) 35 lb (155 N) Axial 40 lb (178 N)
*Service life of bearings	5.0×10^9 revolutions
Working temp. range	0...+70 °C
Storage temp. range	-20...+85 °C
Permissible relative humidity	95 % (condensation not permitted)
Shock resistance	50Gs for 11 ms
Vibration resistance	5 to 2,000 Hz at 20 Gs
Protection Class	IP65
Working voltage range	4.75 to 5.25 V 11.4 to 12.6 V 8.0 to 24.0 V
Working current at no load	120 mA
Optional signal cable	(power supply and drain wire are isolated from housing)—Diameter 0.19 in (5 mm)

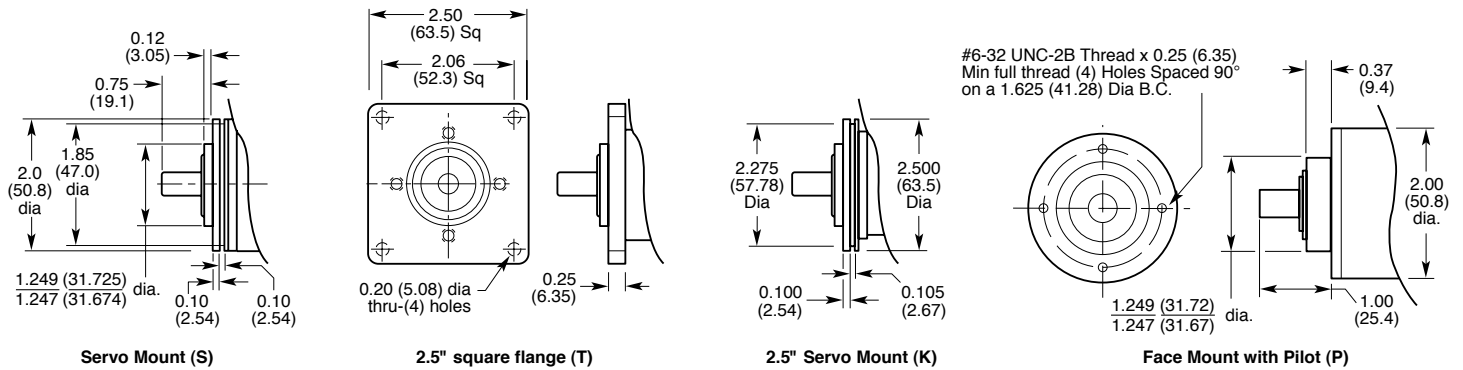
*B10 Life with shaft loading of 10 lb axial and 10 lb radial (end of shaft)

HD20

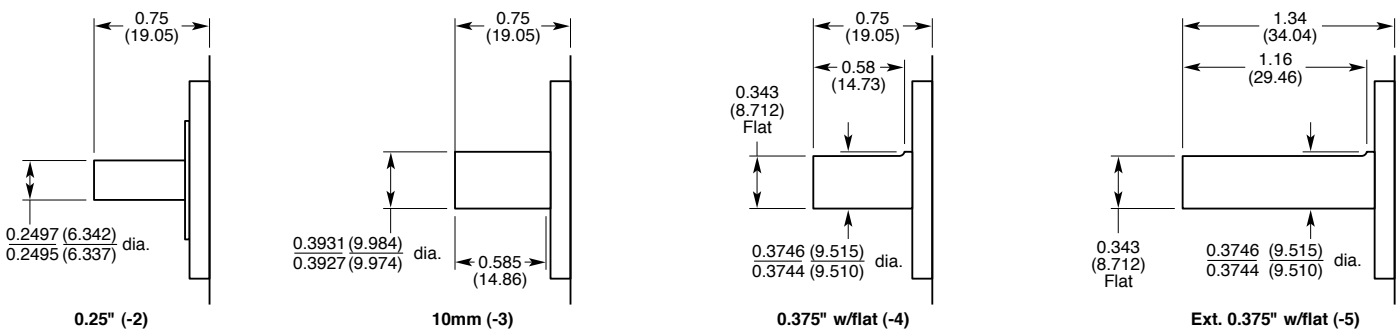
Dimensions in. (mm)



Mounting Options



Shaft Options



HD20

How to Order

Shaded features available from stock. Construct a model number per the example below:



Example for ordering

HD20 **DM** - **1000** - **5** **LD** - **S** **10** **B** - **1**

Output channels

DM: Dual channel with marker

DG: Dual channel with gated marker

Pulses per revolution

Select from table

Supply voltage/output configuration

5LD: 5VDC line driver

8/24LD: 8 to 24VDC line driver

50C: 5VDC open collector (no pullups)

120C: 12VDC open collector (no pullups)

Mounting

F: Flange, 2" square

S: Servo, 2" dia.

T: Flange, 2.5" square

K: Servo, 2.5" dia.

P: Face Mount

Connector type

6: MS3102R-14S-6P (6 pin)

10: MS3102R-18-1P (Required with line driver, 10 pin)

C: 8 cond. shield cable, 18" long

Connector position

S: Side

B: Back (Not available with 8/24 LD)

Shaft designation

1: 3/8" dia., standard

2: 1/4" dia.

3: 10mm dia., (f6/_{.3931}/_{.3927})

4: 3/8" dia., with flat

5: Extended 3/8" dia., with flat

Optional features

A: Shaft seal - standard

Blank: None

Order mating connectors separately

Pin #	Mating Connector
6	MS3106F-14S-6S
10	MS3106F-18-1S

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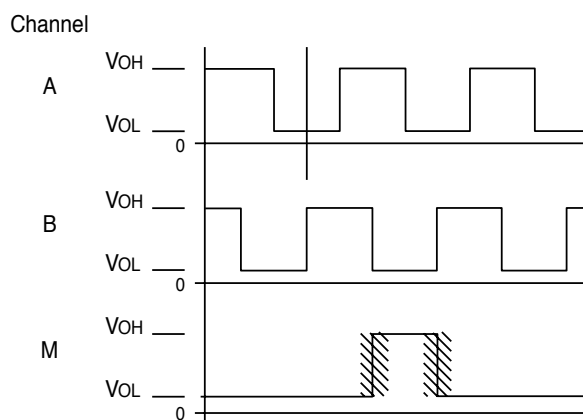
Electrical Connections

Function	Connector Types		
	6 pin	10 pin	Cable
Common	A	F	Black
+Vs	B	D	Red
M output	C	C	White/Black
A output	E	A	White
B output	D	B	Green
Case Ground	F	G	N/A
\bar{A} output	N/A	H	Blue
\bar{B} output	N/A	I	Orange
\bar{M} output	N/A	J	Red/Black
Shield	-	-	Drain wire

Output Waveforms

Notes

1. **Channel B** leads **Channel A** for clockwise rotation when viewed from shaft end.
2. Marker pulse is approximately centered on negative going **Channel A**.
3. Complementary signals (\bar{A} , \bar{B} , and \bar{M}) are standard only with line drivers. Ten pin connector is required.



Shaded areas represent the locus of leading and trailing edges of marker pulse.